PHYSIOLOGY.

UNDER THE CHARGE OF

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Coagulation of the Blood.

C. **Holzmann** gives a critical review of the literature on this subject, and the details of some experiments of his own performed in the pharmacological laboratory of Prof. Dogiel, of Kasan, from which he obtains results, on the whole, confirmatory of the views of Hammarsten, viz., that coagulation is essentially a fermentive process, the fibrinogen undergoing a change which results in the separation of an insoluble substance, rich in oxygen—fibrin—from another kind of albumen, poor in oxygen, which remains in solution but in less quantity. The following are his conclusions:

(1) A certain globulin can be prepared from horse's blood identical with fibrinogen. It does not coagulate at ordinary room-temperature or on the addition of distilled water.

(2) Typical coagulation may be produced in this solution of fibrinogen by treatment with any of the following: Defibrinated blood; blood serum; watery extract of the alcoholic precipitate of the albumens of blood serum or egg albumen; products of decomposition of boiled egg albumen; the passage of a prolonged current of oxygen.

(3) Fibrin ferment is not peculiar to the blood, but occurs also among the products of decomposition of albumen.

(4) That fibrin is the result of a process of oxidation occurring in the fibrinogen is supported by the facts; and typical coagulation follows the passage of a current of oxygen through the solution of fibrinogen; that coagulation is ordinarily a fermentive action; and in the coagulation of the blood the fermentation and the oxidation cannot be separated one from the other.

(5) When a dog is bled to death, the last blood that flows coagulates more quickly than the first, though there is no appreciable increase in the amount of fibrin formed.

(6) The well-known fact that venous blood coagulates less quickly than arterial.—*Archiv für Anatomie und Physiologie,* July 20, 1885, p. 210.

Bronchial Movements.

Prof. Roy and **Dr. Graham Brown** made a preliminary communication to the Physiological Society (*Journal of Physiology,* July, 1885) of an investigation on the above subject, which still was occupying their attention.

They introduced into the bronchus a sound made of a bent glass tube, at the distal extremity of which was a bag of animal membrane distended with air, so as to occlude the air-passage in which it lay. The proximal end of the glass tube was in connection with a special recording apparatus. Any change in the capacity of the branches of the occluded bronchus was thus graphically recorded.

Stimulation of the uncut vagus caused contraction of the bronchi, if the other nerve be intact, but dilatation if the nerve of the other side be previously cut. Section of one vagus caused dilatation of the bronchi of the lung of that side. Stimulation of the peripheral end of the cut vagus caused contraction more marked than when both nerves are intact. Stimulation of the central end of the cut nerve sometimes caused contraction, but in a much less marked degree than the other end, while in other cases "powerful expansion" followed. Cessation of the artificial respiration causes expansion of the bronchi while the vagi are intact, but has no effect when the nerves are cut. Both atropine and nicotine seem to paralyze the effect of the vagus on muscles of the bronchi. They conclude that the vagi are the only means of communication between the cerebro-spinal centres and the bronchial muscles, and that these nerves carry impulses both to and from the bronchi, tending either to contract or expand the tubes. They give no explanation of the probable uses of this motor mechanism of the bronchial tubes.

THE HEART'S FIRST SOUND.

Having failed to find cessation of the heart's first sound on clamping the veins, or its immediate reappearance in its fullest intensity when the vessels were set free, **YEO** and **BARRETT** examined with a flexible binaural stethoscope the ventricles of a cat and two dogs after having removed them from the animals. In each case the empty ventricle gave a distinct sound. In the dogs the sound could be heard after the auricles were severed from the ventricles, and they conclude that "a definite and characteristic tone, similar in quality to the first sound, is produced by the heart muscle under circumstances that render it impossible for any tension of the valves to contribute to its production." This fact was demonstrated at the meeting of the Physiological Society on 9th of May.—*Journal of Physiology*, July, 1885.

In the same number of this Journal (p. 287) **HERROUN** and **YEO** call attention to the inadequacy of the proofs that the so-called muscle tone of skeletal muscles depends on a number of successive, fused contractions like artificial tetanus, and to the fact that any regular vibrations which are too slow—*i. e.*, too deep in tone—to be heard as a musical note, give the sensation of a tone identical with the proper resonant tone of the membrana tympani (Helmholtz). They then examined with a flexible binaural stethoscope both human and cat's muscles, and found that with the slowest rates of stimulation the quality of tone could be heard. They conclude:

(1) That a single contraction of a skeletal or heart muscle gives rise to motions or vibrations which evoke the resonant tone of the membrana tympani in the same manner as the tetanic or voluntary contraction.

(2) That the tone heard in voluntary contraction is no evidence of distinct or regular vibrations in the muscle, but merely of motions, regular or irregular, which produce the vibration of the membrana tympani.

(3) That the tone heard in voluntary contraction is, therefore, no evidence of regular discontinuity of natural nerve impulses, but simply depends upon trembling movements due to variations, either of force or distribution of stimulation.

(4) That the objection to the first heart sound's being a muscular sound